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THESIS/~~DISSERTATION~~

The Effectiveness of a Nurse-Managed Smoking Cessation  
Intervention in Hospitalized General Surgical Patients



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THESIS ABSTRACT

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TITLE OF THESIS: THE EFFECTIVENESS OF A NURSE-MANAGED SMOKING  
CESSATION INTERVENTION IN HOSPITALIZED  
GENERAL SURGICAL PATIENTS

The purpose of this pilot study was to determine the effectiveness of a nurse-managed smoking cessation intervention during hospitalization on short-term smoking abstinence. Hospitalized smokers (n=28) undergoing general surgery were randomly assigned to either an experimental or control group. Experimental group subjects received a structured smoking cessation intervention during hospitalization. After discharge, the experimental subjects were contacted by phone, once per week for five weeks. Control group subjects only received usual care as provided by the hospital staff. A self-report of smoking status and a saliva sample for cotinine analysis were obtained at subjects' first post-discharge clinic visit. Subjects having a saliva cotinine level of < 10 ng/mL were classified as abstinent. The intervention did not significantly decrease smoking cessation rates of the experimental subjects; only 8% of the experimental subjects and 13% of the control subjects quit smoking.

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THE EFFECTIVENESS OF A NURSE-MANAGED  
SMOKING CESSATION INTERVENTION  
IN HOSPITALIZED GENERAL SURGICAL PATIENTS

A Thesis

Presented in Partial Fulfillment of the Requirements for  
the degree Master of Science in the  
Graduate School of The Ohio State University

by

Virginia B. Desimone, B.S.N.

\* \* \* \* \*

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## CHAPTER I

### INTRODUCTION

#### Background

Cigarette smoking is the primary, preventable cause of death and disability in our society. As documented in the 1989 Surgeon General's Report, approximately 390,000 Americans die each year from disease caused by smoking (USDHHS, 1990a). Stated another way, smoking is directly responsible for more than one of every six deaths in our country (USDHHS, 1990b). According to the 1988 Surgeon General's Report, authors of tens of thousands of studies have documented that smoking gives rise to a variety of cancers, chronic obstructive lung disease, heart disease, complications of pregnancy, and several other negative health effects (USDHHS, 1988).

Many of the complications associated with the postoperative recovery of general surgery patients are aggravated by smoking. For example, smoke irritates the tracheobronchial tree, resulting in increased secretions that impinge on the airway and decrease ventilation (Hanley & Tyler, 1987). Consequently, a smoker's response to the anesthetic and ability to cope with respiratory problems, such as pneumonia or atelectasis, may be significantly compromised (Long, Gowin, & Bushong, 1979). Smoking also causes

vasoconstriction, which leads to delayed wound healing (Lind, Kramhoft, & Bodtker, 1991).

Patients who continue to smoke postoperatively increase their risk for adverse health effects; this is especially true in the case of peptic ulcer patients who have undergone partial gastrectomies. If postoperative gastric ulcer patients do not quit smoking, their risk of having shortened life expectancies from cancer-related deaths, particularly carcinoma of the lung, significantly increases (Tersmette, Johan, Offerhaus, Giardiello Brand, Tytgat, Tersmette, & Vandenbroucke, 1991). Smoking cessation after partial gastrectomy surgery may provide the greatest improvement in the long-term prognosis of patients (Tersmette et al., 1991). Hence, a structured smoking cessation intervention during hospitalization may enable those individuals persisting to smoke an opportunity to quit following surgery.

Today, with many hospital policies prohibiting smoking, patients are confined to smoke-free environments. Capitalizing on this situation, health-care professionals have tremendous potential to motivate and assist smokers to quit (Orleans, Rotberg, Quade, & Lees, 1990). In particular, adoption of a simple, structured intervention by inpatient nurses may significantly increase patients' cessation rates.

#### Research Question

What is the effect of a nurse-managed smoking cessation intervention on short-term abstinence in hospitalized general surgery patients?

## CHAPTER II

### LITERATURE REVIEW

#### Literature Review

Despite the plethora of literature on the topic of smoking, minimal attention has been given to the general surgery patient population. Of the few studies which exist, the greatest number focus on patients who have undergone peptic ulcer surgery. Excess mortality from smoking-related diseases, such as lung cancer, in postgastrectomy patients who continue to smoke has been well-documented (Tersmette et al., 1991; Schwartz, 1987). In addition, recurrence rates of gastric ulcers are increased for smokers (USDHHS, 1979).

Smoking is a set of behaviors that evolve over time; it is a complex process (Fisher, Haire-Joshu, Morgan, Rehberg, & Rost, 1990). The 1988 Surgeon General's Report (USDHHS, 1988) presented numerous findings indicating that nicotine, conditioning, and social factors interact in the determination of smoking. Nicotine's biologic potency may make the habits that comprise smoking patterns stronger and more resistant to change (Fisher et al., 1990). As a result, many repetitions of contemplating cessation, attempting to quit, and relapsing are likely to precede permanent cessation (Fisher, Bishop, Goldmuntz, & Jacobs, 1988). Hence, the average successful

quitter reports numerous and often many failed attempts before achieving maintained abstinence.

An extensive body of research has demonstrated nicotine as being the drug in tobacco that causes addiction (USDHHS, 1988). The 1988 Surgeon General's Report defines addiction as "self-administration of a psychoactive drug in a manner that demonstrates that the drug controls or strongly influences behavior" (USDHHS, p. 248). Nicotine is a physically and psychologically addictive drug, characterized as such by (a) the person's relative loss of control regarding use, (b) the strength of the addictive behavior, (c) the occurrence of withdrawal signs and symptoms with abstinence, (d) an increased craving to use the drug following abstinence, and (e) the tendency to relapse even though the acute phases of withdrawal usually end within two weeks of nicotine abstinence (USDHHS, 1989).

A person who abruptly stops smoking, after using nicotine daily for several weeks, is likely to experience withdrawal symptoms (Pomerleau & Pomerleau, 1987). Frequently occurring within 24 hours, withdrawal symptoms may persist for several days to weeks (Haire-Joshu, 1991). Consequently, a hospitalized smoker, who is denied the opportunity to smoke, may experience an increased craving for cigarettes, irritability, anger, nervousness, anxiety, restlessness, headaches, light-headedness, or increased hunger (Pomerleau & Pomerleau, 1987). Other effects of abrupt smoking cessation

include decreased memory recall and decreased concentration.

Presently, most smokers are encouraged to stop by their physician, but minimal attention is given to structured smoking cessation intervention during hospitalization. Given the power and potency of nicotine as a physiologically and behaviorally active drug, hospital policies that mandate a smoke-free environment must concurrently address the concerns of smoking patients. Teaching smoking cessation strategies during hospitalization, at a time when patients are nonsmokers, is desirable from a logistical standpoint. The 1984 Surgeon General's Report noted the positive relationship between severity of illness and increased adherence in smoking cessation (USDHHS, 1984). Thus, hospitalization represents a critical health-care incident and "teachable moment," likely to raise personalization of the risks of cigarette smoking (Gritz, Ward, Beumer, Carr, & Rapkin, 1990).

Owing to the multifaceted nature of smoking and quitting, multicomponent smoking cessation programs have demonstrated relatively high levels of clinical success, as compared to single interventions (Schwartz, 1987). A 40% success rate for short-term smoking abstinence has been documented in multicomponent programs (Schwartz, 1987; Fisher et. al., 1990).

Multiple smoking cessation interventions suggested by all authorities include: (a) direct, face-to-face advice and suggestions about smoking cessation, (b) smoking cessation

self-help materials that are culturally and educationally relevant for the individual person, (c) referral to community smoking cessation programs, (d) drug therapy when appropriate (eg., nicotine gum), and (e) scheduled reinforcement with the smoker (Frank-Stromberg & Cohen, 1990).

According to Fisher et al. (1988), smoking cessation interventions used by health providers can be instrumental in promoting an atmosphere that encourages nonsmoking. Likewise, early initiation of the intervention in the hospital contributes to relapse prevention (Taylor, Houston-Miller, Killen, & DeBusk, 1990). Nurses represent the largest group of health-care professionals available to assist patients with smoking cessation interventions.

Nurses may be viewed as catalysts for nonsmoking. Nursing efforts to develop, implement, and evaluate smoking cessation interventions may significantly decrease patients' health complications and personal financial expenditures (Henningfield & Nemeth-Coslett, 1988). A landmark study conducted by Taylor et al. (1990) concluded that a nurse-managed, hospital-based smoking cessation intervention program reduced smoking rates in patients who had experienced a myocardial infarction. Accordingly, this study was designed to evaluate the effectiveness of a structured, nurse-managed smoking cessation intervention delivered to hospitalized general surgery patients.

To summarize, only a few investigators have examined the role of smoking in general surgery populations, and the greatest number of these studies document the association of postgastrectomy patients' continued smoking with excess mortality from lung cancer and peptic ulcer disease recurrence. Taylor et al. (1990) demonstrated that a structured, nurse-managed intervention during hospitalization increased adherence to smoking cessation in patients who had experienced a myocardial infarction. After a thorough search of smoking-related literature, no studies were found that addressed smoking cessation during hospitalization of general surgery patients. Hence, the nursing intervention of this study was tailored to general surgery patients. The findings of this study will benefit health care providers as they design therapeutic strategies to promote maintenance of smoking abstinence.

## CHAPTER III

### METHODS

#### Design

This pilot study was part of a larger clinical intervention study being administered to hospitalized smokers.

Evaluation of short-term smoking abstinence was based on a posttest only experimental design. Upon admission into the study, smoking subjects were randomly assigned to either an experimental or control group. The experimental group received a structured smoking cessation intervention during hospitalization, whereas, the control group received "usual" care. To evaluate the effectiveness of the intervention, a saliva sample was collected for cotinine analysis at the time of each subject's first postoperative clinic visit.

#### Setting and Subject Selection

The setting for this study was The Ohio State University Hospital. All Ohio State University Hospitals have a no smoking policy.

Patients undergoing general surgery with an estimated length of hospitalization greater than three days were recruited to participate. Subject criteria included: (a) 19 years of age or older, (b) continuous use of tobacco for at least one year prior to participating in this study, (c) use

of tobacco at a level equivalent to more than 10 cigarettes per day, with each cigarette containing a minimum of 0.5 mg of nicotine, and (d) informed written consent. Criteria (b) and (c) are considered definitive elements of a nicotine dependence diagnosis (DSM III-R, 1987).

Recruitment of subjects was accomplished by a graduate nursing student prior to group assignment. Patients who were hospitalized during the period of the study and who met the subject criteria were asked to participate. Review of daily operating room schedules aided in identification of patients who had estimated lengths of stay exceeding three days. To determine eligibility, a chart review and structured interview were conducted with each potential subject (see Appendix A).

Subjects were informed they were being recruited to participate in a research study, and the purpose of the study was to describe the effectiveness of patient education during hospitalization (see Appendix B). Subjects were not informed that a smoking intervention was being evaluated because this information may have biased smoking behavior. If subjects realized the effect of the smoking cessation intervention was the focus of the study, internal validity would have been jeopardized (Cook & Campbell, 1979). Thus, subjects received a full explanation of the study's purpose at the completion of the procedures; permission to not disclose the purpose at time of informed consent was obtained from the Human Subjects Review Committee. This study had been approved by the The Ohio State University Biomedical Science Review Committee.

### Measures

At the time of a subject's entry into the study, confounding variable data were obtained for post hoc analysis. Nicotine dependence, level of stress, length of hospitalization, and smoking status of significant others were documented. A questionnaire was used to record items such as sociodemographics, smoking history, and intervention visits. Additional measures employed in this study were the Fagerstrom Tolerance Questionnaire, the Life Change Inventory, a self-reported smoking rate post-discharge, and a post-discharge saliva cotinine sample.

At baseline, strength of physiologic nicotine addiction was assessed using the Fagerstrom Tolerance Questionnaire (TQ) (see Appendix C). The TQ is a widely used instrument by both researchers and clinicians to classify smokers on the basis of nicotine dependence (Pomerleau, Pomerleau, Majchrzak, Kloska, & Malakuti, 1990). This scale is comprised of 8 items, with scores ranging from 0 to 11 points. Scores greater than or equal to 7 indicate a high degree of dependence, whereas, scores less than or equal to 6 indicate a low degree of dependence (Pomerleau et al., 1990).

Pomerleau et. al (1990) demonstrated the criterion-related validity of the TQ by documenting findings that TQ scores significantly correlated with plasma cotinine levels, a biochemical measure of nicotine dependence, within the study's two separate samples. The validity coefficients for

Sample I and Sample II were ( $r = .33$ ,  $p < .001$ ) and ( $r = .42$ ,  $p < .005$ ), respectively. Evidence for the reliability of this measure ( $r = .82$ ,  $p < .0001$ ;  $N = 46$ ) was provided by laboratory test-retest checks performed by Pomerleau et al. (1990).

Subjects' degree of stress was measured by the Life Change Inventory (LCI) (see Appendix D). Developed by Dohrenwend and Dohrenwend in 1974, the LCI is a 14 item self-report instrument that aids in assessment of life event changes occurring within the past three months (Gunn, 1983). The LCI is a modified version of the Holmes and Rahe Social Readjustment Scale (Dohrenwend & Dohrenwend, 1974), collapsing a number of those items together and excluding most positive life changes that have not been shown to increase the scale's predictability (Sarason, Johnson, & Siegel, 1978). Since no weighting of responses is done following Skinner's & Lei's (1980) suggestion, a subject's score on the LCI is the sum of all "yes" answers.

In a study conducted by Gunn (1983), results indicated that high life stress scores were strong predictors for men of not stopping smoking and dropping out of a stop smoking clinic ( $X^2 = 16.7$ ,  $p < .005$ ). Only 13% of the high life stress (scoring three or more changes on the LCI) male group quit smoking, compared to 56% of the men in the low life stress score group. LCI scores did not predict stopping in women. However, when young (40 or under), lighter-smoking females were compared to older, heavier-smoking women in terms of

stopping, a significant relationship occurred ( $X^2 = 4.49$ ,  $p < .05$ ), with the younger group being more successful (Gunn, 1983). No reliability coefficients for the LCI were noted in the report.

For the purpose of this study, the LCI was used as a distracting variable. During the initial interview with subjects, it was important they were not cued to the recruiter's sole interest about smoking. Asking subjects to complete the LCI shifted attention away from smoking-related questions. As noted previously, if subjects were aware that a smoking cessation intervention was being evaluated, it may have biased smoking behavior.

At the study's endpoint (first postoperative clinic visit), the graduate nursing student determined abstinence from smoking by subjects' self-report of current smoking rates as well as their saliva cotinine levels. Specifically, smoking abstinence was defined as a self-reported smoking rate of zero cigarettes per day and a saliva cotinine level of less than or equal to 10.0 ng/mL as assayed by high performance liquid chromatographic methods (Machacek & Jiang, 1986). Cotinine, the principal metabolite of nicotine, has a long half-life (19 to 30 hours) and is an accurate tobacco-use marker of even light or intermittent smoking (Carey & Abrams, 1988). In a study by Abrams, Follick, Biener, Carey, and Hitti (1987), the validity of saliva cotinine as an outcome measure for use in smoking intervention research was

examined. Results indicated that salivary cotinine was correlated with rate of smoking ( $r = .43$ ; 95% confidence interval [CI] = .20, .61) and with dose (daily rate x nicotine content) ( $r = .46$ ; 95% CI = .24, .64). Additionally, research by Haley, Axelrad, and Tilton (1983) found plasma cotinine and salivary cotinine to be highly correlated ( $r = .90$ ).

In the study by Abrams et al. (1987), acceptable reliability of repeated salivary cotinine samples was demonstrated. Subjects provided two consecutive samples of saliva over a period of 15 to 20 minutes; the two sequential samples were closely correlated ( $r = .83$ ; 95% CI = .65, .94). Haley et al. (1983) also noted salivary cotinine was a reliable alternative to plasma for validation of smoking status.

Salivary cotinine analyses was completed using a liquid chromatographic method. The standard curve is linear from 1-1000 ng/mL, and the interassay coefficient of variation is 4% (Hariharan, VanNoord, & Greden, 1988). The extraction efficiency of cotinine from saliva is 95% (Hariharan et al., 1988).

#### Experimental Protocol

Recruitment of subjects by the graduate nursing student was accomplished prior to surgery or during the first or second postoperative day. At time of recruitment, informed consent was obtained, and every subject received a copy. Once the consent was signed, random assignment of each, consecutive subject was made, either to the experimental or control group.

Group assignment was based upon a table of random numbers specifically designed for this study (SAS, 1985).

Subjects in the control group received "usual" care as provided by the hospital staff. Subjects in the experimental group received a nurse-managed multicomponent smoking cessation intervention during their postoperative period. For a diagram of the experimental intervention, see Figure 1. The intervention was delivered on three consecutive days by a nurse who was a certified American Lung Association smoking cessation counselor (see Appendix E).

On the first day of the intervention, the nurse reviewed the benefits of not smoking and possible postoperative complications that are aggravated by smoking. The subject was also given a pamphlet, entitled "Smart Move," published by the American Cancer Society (1988). The pamphlet content emphasizes quitting smoking and preventing relapse.

On the second day of the intervention, the subject received an audio tape produced by the American Lung Association (1991). The tape contains guided imagery, along with deep breathing and progressive muscle relaxation exercises. Relaxation techniques were demonstrated by the smoking cessation counselor, and the subject was encouraged to practice them.

The third day, verbal reinforcement of the previous two day's teaching was accomplished. In addition, the nurse answered any remaining questions the subject may have had

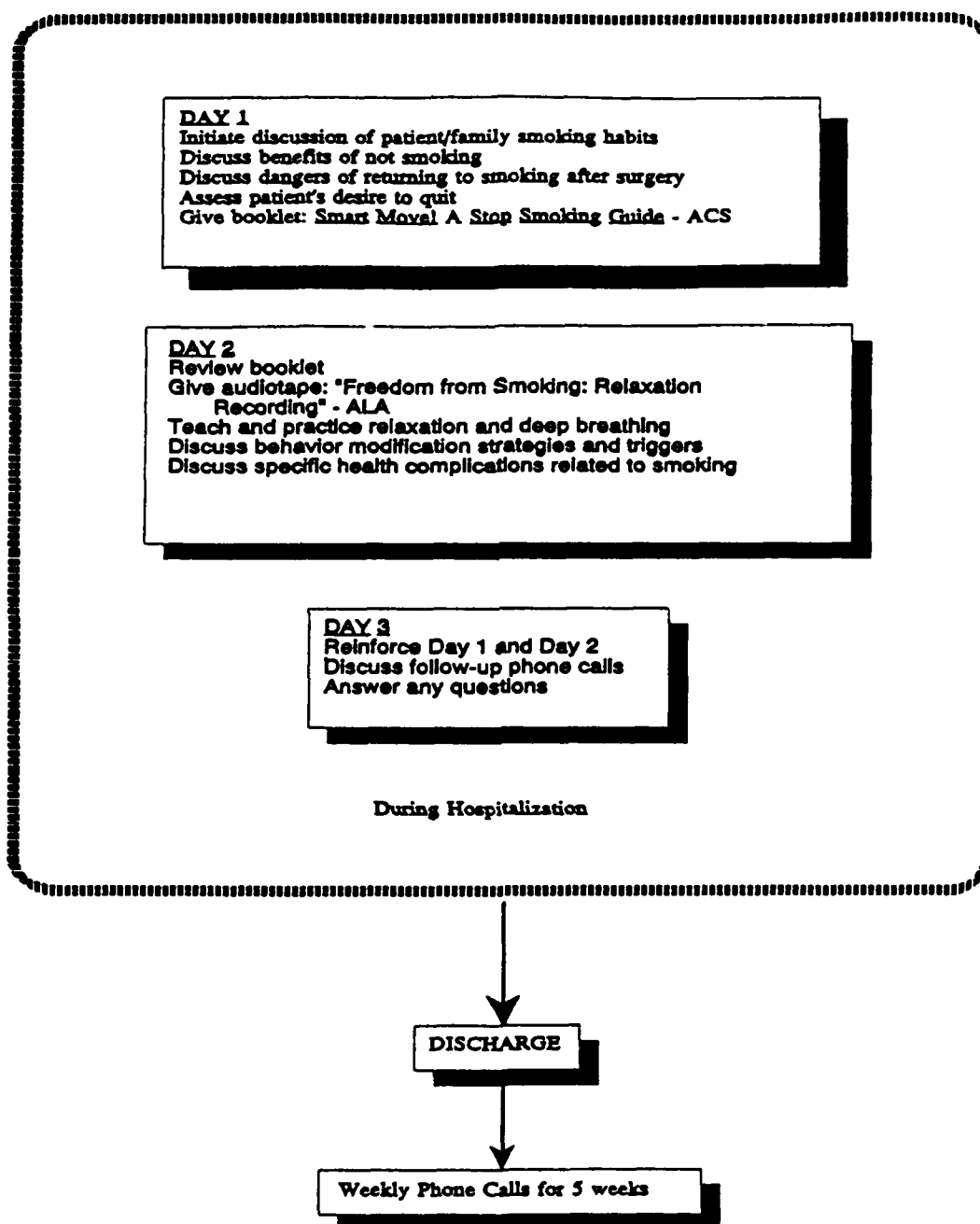


Figure 1. Experimental Intervention

about smoking cessation.

After discharge, the nurse smoking cessation counselor initiated five telephone calls with each experimental subject, once per week for five weeks. The purpose of the telephone contact was to encourage maintenance of successful smoking cessation, to discuss any relapses, and to report smoking status.

A self-report of smoking status and a saliva cotinine sample were obtained from subjects in both the experimental and "usual" care groups by the graduate nursing student at each subject's postoperative clinic visit (2 to 6 weeks after surgery). The Salivasac (BioQuant), a means for the collection and transport of the saliva sample, was positioned on the tongue after moistening; then, it was moved around continuously for approximately five to ten minutes. Specific guidelines and technical specifications of the BioQuant manufacturer were followed (see Appendix F). After obtaining 1 mL of each subject's saliva, the sample was immediately drawn into a syringe, weighed, and injected into a 5 mL polypropylene tube. The tubes were capped and stored at  $-70^{\circ}\text{C}$  until time of analyses.

After all subject salivary samples had been collected, cotinine analyses was performed using a liquid chromatographic method (Hariharan et al., 1988). Subjects with a cotinine level of less than 10.0 ng/mL were classified as nonsmokers.

## CHAPTER IV

### DATA ANALYSIS

Data analysis was completed using the Minitab IBM Statistical Package, Release 7 (State College, Pennsylvania, 1989). Descriptive statistics and percentages were used to describe characteristics of the study sample. Inferential statistical analyses included use of the chi-square test of significance and the t-test; determinations of pretreatment equivalence between groups with regard to TQ scores, LCI scores, and select sociodemographic variables were made.

#### Results

##### A. Description of the Sample

Over a 6 month period, 38 general surgical patients were screened and identified as meeting the study's eligibility criteria. Of the 38 patients, 4 individuals (10%) declined to participate in the study, 2 people (5%) did not have telephones available to them at home, and 2 patients (5%) were discharged from the hospital earlier than anticipated. Two experimental group subjects (15%) developed serious complications during hospitalization that extended their stays over 55 days and were subsequently dropped from data analysis. Hence, the total number of subjects successfully recruited and retained in the study was 28 (74%), with 13 and 15 subjects

in the experimental and control groups, respectively.

At baseline, demographic characteristics of the experimental (intervention) and control (usual care) groups were similar, with exception of age (see Table 1). Ages ranged from 21 to 73 years. The control group subjects were significantly older ( $M = 44.47 \pm 11.80$ ) than the experimental group subjects ( $M = 34.08 \pm 10.49$ ). The sample ( $n=28$ ) was comprised primarily of men (64%), with 10 in the intervention group and 8 in the usual care group. Eighty-six percent of all subjects were white; eleven were in the intervention group and 13 were in the usual care group. Of the 10 married subjects in the sample (36%), 6 were in the intervention group and 4 were in the usual care group. The majority of subjects had blue collar occupations (46%), with 8 and 5 in the intervention and control groups, respectively. Education ranged from 7 to 14 years, with an average of 11.21 ( $SD \pm 1.49$ ) years. Eighteen percent of the sample reported alcohol use, and 7% of those also smoked marijuana.

The sample included the following types of surgical cases: 3 gastroenterology, 3 genitourinary, 5 neurology (CNS operations excluded), 6 plastic, 7 orthopedic, and 4 other. Length of the subjects' hospitalization ranged from 3 to 36 days, with an average stay of 11.67 ( $SD \pm 7.70$ ) days.

#### B. Smoking histories

Smoking histories revealed only one significant difference between groups, specifically, number of years

Table 1

Baseline Sample Characteristics According to Group

Characteristic	Intervention Group (n=13)		Usual Care Group (n=15)	
	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>
Male	10	77	8	53
White	11	85	13	87
Married	6	46	4	27
Blue Collar Worker	8	62	5	33
Self-Report Alcohol Use	3	23	2	13
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Age *	34.08 ± 10.49		44.47 ± 11.80	
Length of Stay in Hospital (days)	13.08 ± 8.15		10.27 ± 7.29	
Education (years)	11.62 ± 1.12		10.80 ± 1.74	

\* p &lt; .05

smoking (see Table 2). Subjects' years of smoking ranged from 5 to 57. The usual care group subjects smoked significantly more years ( $M = 26.27 \pm 11.09$ ) than the intervention group subjects ( $M = 15.39 \pm 7.67$ ). Seventeen subjects smoked a brand of cigarettes containing a medium amount of nicotine (1.0-1.2 mg), 9 smoked cigarettes with a low (0.9 mg or less) proportion of nicotine, and 2 smoked cigarettes having a high (1.3 mg or greater) content. Two subjects also smoked cigars, a pipe, or used chewing tobacco. Cigarettes smoked per day ranged from 2 to 50, with an average of 21.43 ( $SD \pm 12.43$ ) cigarettes per day. Sixteen of the 28 subjects (57%) had smokers living in their homes.

#### C. Fagerstrom Tolerance Questionnaire (TQ) Scores

Subjects' baseline TQ scores ranged from 2 ( $< 6$  indicating low nicotine dependence) to 9 ( $\geq 7$  indicating high nicotine dependence). No significant difference was found between the TQ scores of the intervention group ( $M = 6.0$ ,  $SD \pm 2.45$ ) and the usual care group ( $M = 6.53 \pm 2.88$ ) (see Table 2). Both group mean scores indicated low nicotine dependence.

#### D. Life Change Inventory (LCI) Scores

Subjects' scores on the LCI ranged from 0 to 9, with a mean score of 4.03 ( $SD \pm 2.26$ ). A significant difference existed between the LCI scores of the intervention group ( $M = 4.92 \pm 2.60$ ) and the usual care group ( $M = 3.13 \pm 1.92$ ). Additionally, the mean score for the male subjects in the intervention group was 5.20, compared to 3.25 for the usual

Table 2

Baseline Smoking Variables According to Group

Variable	Intervention Group (n=13)		Usual Care Group (n=15)	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Years of Smoking *	15.39	± 7.67	26.27	± 11.09
Cigarettes Smoked Daily	21.38	± 13.62	21.47	± 11.31
Fagerstrom Tolerance Questionnaire Score	6.0	± 2.45	6.53	± 2.88
<hr/>				
	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>
Other Smokers in the Home	6	46	10	66
High Nicotine Cigarette Brand	0	0	2	13
Medium Nicotine Cigarette Brand	7	54	10	67
Low Nicotine Cigarette Brand	6	46	3	20

\* p &lt; .05

care group. On average, female subjects in the intervention group scored 4.0, whereas those in the usual care group scored 3.0. Subjects' most commonly identified stress (46%) was experiencing changes in eating, drinking, or sleeping habits. The second most frequently reported life change event by subjects (43%) was that someone close to them recently had a serious illness, an accident, or died; another (43%) had experienced a major disappointment or change in life goals.

#### E. Delivery of the Intervention

Two experimental subjects refused the intervention but were retained in the study. Also, one subject was given the intervention yet requested not to be called on the phone after discharge. Hence, only 25 (89%) subjects received all components of the intervention.

#### F. Saliva Collection at the First Clinic Visit

Every attempt was made by the graduate nursing student to obtain 5 week post-discharge saliva specimens from all remaining subjects (n=25). Only 17 subjects agreed to participate in saliva collection. Since subjects were unaware that a smoking intervention was being evaluated at the time of informed consent, they did not realize a saliva specimen would be obtained at their first post-discharge clinic visit. If the graduate nursing student and a subject were unable to coordinate meeting at the first clinic appointment, an alternative arrangement was suggested by the student. Many subjects stated it was inconvenient to meet at another time

for saliva specimen collection. The 11 subjects who did not provide specimens all self-reported smoking; accordingly, they were classified as smokers at the study's endpoint.

#### G. Biochemical Verification

Saliva samples were collected from subjects between weeks #2 and #8. On average, specimens were obtained at week #4. Saliva cotinine levels ranged from 0 ng/mL to 1074 ng/mL.

Based upon saliva cotinine analyses, 3 of the 28 hospitalized general surgical subjects (11%) had quit smoking at their first post-discharge clinic visit (see Table 3). Supported by biochemical verification (saliva cotinine level < 10ng/mL), 1 of 13 (8%) experimental subjects stopped smoking, and 2 of the 15 (13%) control subjects quit. Thus, the study's intervention did not make a significant difference in subjects' smoking cessation rates.

Table 3

#### Smoking Status at First Clinic Visit According to Group

	Smokers		Nonsmokers		Total
	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>
Intervention Group	12	92	1	8	13
Usual Care Group	13	87	2	13	15
<u>Total</u>	25	89	3	11	28

## CHAPTER V

### DISCUSSION AND IMPLICATIONS

#### Discussion

The purpose of this study was to determine the effectiveness of a nurse-managed smoking cessation intervention in hospitalized general surgical patients on short-term smoking abstinence. The intervention did not significantly influence smoking cessation rates of the experimental subjects (n=13), five weeks after discharge. Only 8% of the experimental subjects and 13% of the control subjects quit smoking. A discussion of factors that may have contributed to the intervention's poor success rate is warranted.

First, none of the subjects had diagnoses traditionally thought to be related to smoking, such as coronary artery disease, chronic obstructive pulmonary disease, or head and neck cancers. Subjects, who smoked after discharge from the hospital, may not have perceived a real need to quit since cigarette smoking was not a causative factor for them requiring surgery.

Results of a study conducted by Scott and Lamparski (1985) support the motivational aspect of an individual having specific health concerns; they found the only predictor of

long-term abstinence among cardiac veterans was the belief that smoking had contributed to cardiac problems.

Second, only 15 (53%) of the study's 28 subjects had completed high school; no subjects had earned a four year college degree. According to the results of the 1985 National Health Interview Surveys, educational level is a major demographic predictor of whether an individual will smoke cigarettes (USDHHS, 1988). A 35.4% smoking prevalence exists among adults with less than a high school education (USDHHS, 1988).

Third, noteworthy is that 9 (32%) of the sample subjects were either divorced or separated, and 5 (56%) out of the 9 were men; Fisher et al. (1990) suggests that smoking is especially common among these groups. In the 1988 Surgeon General's Report, divorced or separated men had the highest prevalence of smoking, 48.2%, of the 38 subgroups classified by gender and economic, educational, vocational, and marital status (USDHHS, 1988).

Fourth, the study's sample was comprised of relatively young individuals; only 6 of the 28 subjects (21%) were over the age of 50. The 1988 Surgeon General's Report documents the positive relationship between smoking cessation and age. With increasing age, the greater the likelihood that a person will experience the adverse health effects caused by smoking; therefore, as age increases, so does smoking cessation (USDHHS, 1988).

Fifth, another factor that warrants closer examination is the effect of recent life stress on an individual's successful smoking cessation. The sample subjects' LCI scores had a mean of 4.03 ( $SD \pm 2.26$ ). In Gunn's study (1983), a subject who scored three or more changes on the LCI was classified as having high life stress. When high life stress is coupled with the smoker's habit of using cigarettes to alleviate anxiety, motivation to quit smoking could easily be affected (Gunn, 1983). Furthermore, out of the 10 male experimental subjects in the current study, 7 (70%) of them had a LCI score equal to or greater than 4. As noted previously, Gunn's (1983) results indicated that high life stress scores were strong predictors for men of not stopping smoking and dropping out of a stop smoking clinic.

Sixth, the subjects who provided saliva specimens at their first post-discharge clinic visit were asked by the graduate nursing student about the number and types of hospital personnel who discussed smoking cessation with them during hospitalization (excluding the smoking cessation counselor). Only 7 (41%) of the 17 subjects reported receiving any quit smoking advice from health care professionals. Nurses provided advice to merely 2 subjects; physicians spoke to all 7 individuals.

Lastly, the presence of smokers in the home appeared to negatively influence the study's success. The smoking cessation intervention was administered solely to the surgical

subjects and did not address the issue of other smokers living in the home. The graduate nursing student did not routinely question subjects about their live-in smokers' supportiveness about quitting. However, two subjects who continued to smoke perceived the live-in smoker as their biggest barrier to successful cessation.

### Limitations

Several limitations of the study need consideration. First of all, the small sample size greatly minimized any generalizability to the larger general surgical population. Secondly, the study focused only upon the intervention's effect on short-term smoking abstinence. Finally, since the intervention was presented to the experimental subjects as a package, it was not possible to delineate the specific contributions of each component part.

### Areas for Future Research

Recommendations for further research are numerous. Overall, with increasing emphasis in nursing on health promotion and disease prevention, more nursing investigations that focus on smoking cessation are essential.

According to O'Connell (1990), intervention techniques aimed at hospitalized patients, who are usually acutely ill, present unique challenges. Shortened hospital stays reduce the opportunity to deliver hospital-based interventions, and many of the patients' physical conditions and decreased abilities to concentrate in the hospital environment preclude

the type of intensive training that many intervention programs employ (O'Connell, 1990).

Taylor et al. (1990) identified another area of concern in their hospital-initiated smoking cessation intervention. In their study, Taylor et al. (1990) noted that extra time spent by nurses with patients who expressed little intention of quitting did not seem to produce cessation. Given the results of this author's study, it appears that a subject's intent to quit is a variable that has a major impact on an intervention's success. Clearly, more research on methods for addressing the motivational needs of general surgical patients is required.

Future studies are needed to address the different cessation rates among varying diagnostic populations and age groups. For instance, conducting investigations designed to control for both diagnosis and age may be especially useful for identification of other factors influencing successful cessation.

Orleans et al. (1990) recommended examining ways in which interventions could heighten perceived susceptibility to disease-specific smoking health harms. Self-monitoring of smoking-related symptoms or biofeedback, for instance, of spirometry results may be motivating among hospitalized smokers (Orleans et al., 1990). Existing, traditional cessation programs do not appear to be meeting the needs of hospitalized smokers.

Also, adequate long-term follow-up is necessary to assess the effects of any intervention program (O'Connell, 1990). Since relapse rates often rise rapidly after the intensive portions of the interventions are completed, the end-of-treatment success rates are inadequate measures of outcome. Most experts recommend follow-up periods of 6 to 12 months (O'Connell, 1990). At the present time, it is difficult to assess what long-term impact this study's intervention may have on the experimental subjects who continue to smoke. Exposure to smoking cessation strategies may aid smokers to eventually quit, despite discouraging early quit rates.

#### Clinical Implications

Perhaps general surgical patients would benefit from a hospital-sponsored smoking cessation workshop, offered approximately one month prior to their upcoming surgeries. The smoking cessation message could be tailored to the general surgical population, and a nurse-managed intervention could be operationalized before the individual enters the inherently stressful, nonsmoking hospital environment.

The dimensions of smoking and quitting are broader than any one provider or profession can encompass (Fisher et al., 1990). Nonetheless, nurses are capable of having a very constructive impact. Nurses are responsible for actively and assertively disseminating information on the disease potential and other negative health effects of smoking whenever possible (Frank-Stromberg & Cohen, 1990). Every assistance should be

made to help those who want to quit smoking; whether it be referral to self-help or group cessation programs or providing simple advice. Also, it is critical that nurses act as role models by not smoking and by actively working at creating nonsmoking environments in both their work and home settings (Frank-Stromberg & Cohen, 1990).

Nurses can only be effective role models and educators if they understand the methods and disseminate the treatment strategies that may best assist individuals to quit smoking.

## APPENDIX A

### Questionnaire for Recruitment

Patient Name: \_\_\_\_\_ Phone #: \_\_\_\_\_  
S.O. Name: \_\_\_\_\_ Relationship: \_\_\_\_\_  
Address: \_\_\_\_\_ Pt. Hosp. I.D. #: \_\_\_\_\_  
Randomization #: \_\_\_\_\_  
Initial Diagnosis: \_\_\_\_\_  
Group: Control or Experimental  
Adm. Date: \_\_\_\_\_ Discharge Date: \_\_\_\_\_  
Surgery Date: \_\_\_\_\_ Surgeon: \_\_\_\_\_  
Hospital: \_\_\_\_\_ Nursing Unit: \_\_\_\_\_

#### DEMOGRAPHICS:

Age: \_\_\_\_\_ Gender: \_\_\_\_\_ Race: \_\_\_\_\_  
Marital Status: Single Married Divorced Widowed Separated  
Education Level: \_\_\_\_\_ (highest grade)  
Method of Payment: Private Medicare Medicaid Other  
Occupation: \_\_\_\_\_ (or Retired)

EXERCISE: \_\_\_\_\_

DIET: \_\_\_\_\_

STRESS LEVEL: \_\_\_\_\_

#### SMOKING HISTORY:

Length of Smoking: \_\_\_\_\_ (years) Brand: \_\_\_\_\_  
# of Cigarettes/Day: \_\_\_\_\_  
Type of Tobacco: Cigarette Cigar Pipe Chew  
Presence of Smoker in Home: Y or N

Consent Signed: \_\_\_\_\_

## APPENDIX B

### Informed Consent

THE OHIO STATE UNIVERSITY

Protocol No. 90H0114

#### CONSENT TO INVESTIGATIONAL TREATMENT OR PROCEDURE

I, \_\_\_\_\_, hereby authorize or direct Juan Bowen, MD/ME Wewers, Ph.D., or associates or assistants of her choosing, to perform the following treatment or procedure (describe in general terms),

To study my hospitalization course both in the hospital, and after hospital discharge. Subjects may have laboratory specimens obtained.

upon \_\_\_\_\_  
(myself or name of subject)

The experimental (research) portion of the treatment or procedure is:

Evaluation of complications and of the effects of patient teaching in patients.

This is done in part of an investigation entitled:

An evaluation of complications and patient education in hospitalized patients.

1. Purpose of the procedure or treatment:

The purpose of the procedure or treatment is to assess the nature and frequency of complications.

2. Possible appropriate alternative procedures or treatment (not to participate in the study is always an option):

Subjects may decline to participate in the study.

3. Discomforts and risks reasonably to be expected:

Subjects may experience minor inconvenience from visits by the evaluating team. These visits will be 10-15 minutes in duration, occur daily, and consist of several questions concerning how the patient is feeling that day.

4. Possible benefits for subjects/society:

The possible benefits to the subject or to society include improved understanding of the course of patients who have been hospitalized.

5. Anticipated duration of subject's participation (including number of visits):

Subjects may be visited daily during the hospital stay, and will be contacted at six weeks follow-up visit. They may be contacted by telephone at three or six month intervals for up to five years to see how they are doing.

I hereby acknowledge that \_\_\_\_\_ has provided information about the procedure described above, about my rights as a subject, and he/she answered all questions to my satisfaction. I understand that I may contact him/her at Phone No. 292-8179 should I have additional questions. He/she has explained the risks described above and I understand them; he/she offered to explain all possible risks or complications.

I understand that, where appropriate, the U.S. Food and Drug Administration may inspect records pertaining to this study. I understand further that records obtained during my participation in this study that may contain my name or other personal identifiers may be made available to the sponsor of this study. Beyond this, I understand that my participation will remain confidential.

I understand that I am free to withdraw my consent and participation in this project at any time after notifying the project director without prejudicing future care. No guarantee has been given to me concerning this treatment or procedure.

In the unlikely event of injury resulting from participation in this study, I understand that immediate medical treatment is available at University Hospital of The Ohio State University. I also understand that the costs of such treatment will be my expense and that financial compensation is not available. Questions about this should be directed to the Human Subjects Review Office at 292-9046.

I have read and fully understand the consent form. I sign it freely and voluntarily. A copy has been given to me.

Date: \_\_\_\_\_ Time: \_\_\_\_\_ AM PM

Signed: \_\_\_\_\_

Witness(es) if Required: \_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
(Person Authorized to Consent for Subject if Required)

I certify that I have personally completed all blanks in this form and explained them to the subject or his/her representative before requesting the subject or his/her representative to sign it.

Signed \_\_\_\_\_  
(Signature of Project Director or his/her  
Authorized Representative)

APPENDIX C

Fagerstrom Tolerance Questionnaire

1. How many cigarettes a day do you smoke? \_\_\_\_\_
2. What brand of cigarettes do you smoke? \_\_\_\_\_
3. Do you inhale? (circle letter)
  - a. never
  - b. sometimes
  - c. always
4. Do you smoke more during the first two hours of the day than the rest of the day? (circle letter)
  - a. yes
  - b. no
5. How soon after you wake up do you smoke your first cigarette? \_\_\_\_\_ minutes
6. Which cigarette would you most hate to give up?  
\_\_\_\_\_
7. Do you find it difficult to refrain from smoking in places where it is forbidden, eg., in church, at the library, cinema? (circle letter)
  - a. yes
  - b. no
8. Do you smoke if you are so ill that you are in bed most of the day? (circle letter)
  - a. yes
  - b. no

## APPENDIX D

### Life Change Inventory

In the last three months:

- |   |     |    |
|---|-----|----|
| 1. Has your marital status changed?<br>(Married, separated, etc.)   | Yes | No |
| 2. Has your job changed in any way?<br>(New boss, new job, etc.)  | Yes | No |
| 3. Have there been any changes in your living<br>arrangements?  | Yes | No |
| 4. Has anyone close to you had a rather serious<br>illness, accident, or died?  | Yes | No |
| 5. Have you been ill or in an accident?   | Yes | No |
| 6. Has your relationship with someone you are<br>close to gone downhill? (more arguments,<br>sex problems, see person less) | Yes | No |
| 7. Have any financial worries increased for<br>you? (Took out a loan, increased spending,<br>have a lower income, etc.)     | Yes | No |
| 8. Were you involved in trouble with the law?<br>(minor violation, jail term, etc.)   | Yes | No |
| 9. Any changes in your recreational, social,<br>or church activities?   | Yes | No |
| 10. Any changes in your eating, drinking,<br>or sleeping habits?  | Yes | No |
| 11. Has your spouse started or stopped a job?   | Yes | No |
| 12. Have you or your spouse become pregnant?  | Yes | No |
| 13. Any major disappointments or change in<br>life goals?   | Yes | No |
| 14. Anything else upsetting happen? (robbery,<br>fire, feeling increasingly nervous, etc.)                                  | Yes | No |

APPENDIX E

Record of Intervention and Follow-up

INTERVENTION VISITS:

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_

INTERVENTION PHONE CALLS:

	Date	Smoking Status	#Cigs/day	Spoke to Subject Y or N
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____

# of Post-D/C Face to Face Visits During Intervention: \_\_\_\_\_

Cotinine Level \_\_\_\_\_ ng/mL at \_\_\_\_\_ Weeks Post-Discharge

Rehospitalization During Intervention: Y or N

Other Drug Use: Y- Crack ETOH Other or None

Smoking Status (according to cotinine level): Smoker or  
Nonsmoker

## APPENDIX F

### SalivaSac User Instructions

1. Remove SalivaSac from container and dip it into drinking water for 5-6 seconds.
2. Place SalivaSac on tongue and close mouth. Move SalivaSac around continuously for 8 minutes. Mouth should remain closed while using SalivaSac.
3. Do Not Bite or Chew SalivaSac. If a very sweet taste or deflation of the SalivaSac occurs, it has been punctured and must be replaced.
4. Do Not Swallow SalivaSac. Swallow saliva normally while using SalivaSac.
5. Remove after 8 minutes. If crystals are not completely dissolved, replace SalivaSac in mouth for 2-3 minutes more. When crystals are dissolved, place SalivaSac in container and close tightly.
6. Label container and place in refrigerator for storage.

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